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ABSTRACT

Despite a clear relationship between feedback in experiential settings and heightened efficacy, it is unclear whether general feedback occurring outside purely experiential settings impacts preservice teachers' self-efficacy. This study investigated the relationship between self-efficacy in preservice teachers and simple but salient feedback from a non-experiential source. Preservice teachers were placed in matched pairs according to teaching experience, then assigned to either a treatment group or a control group. The treatment group read a stimulus paragraph designed to bolster beliefs about efficacy, rated their agreement with it, wrote their opinion about why preservice teachers are considered effective, and completed the Teacher Efficacy Scale. The control group followed the same protocol but read an unrelated paragraph. Results suggest that the stimulus paragraph had minimal effect on teacher efficacy, and that the minimal effect was primarily due to changes in general teaching efficacy. The results indicate that self-efficacy is strongly experientially based. (Contains 37 references.) (SM)

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Self-efficacy in Preservice Teachers: Testing the Limits of Non-experiential Feedback

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Abstract

Despite a clear relationship between feedback in experiential settings and heightened efficacy, it is unclear if general feedback occurring outside purely experiential settings impacts preservice teacher self-efficacy. The present study investigated the relationship between self-efficacy in preservice teachers and simple but salient feedback from a non-experiential source. Results suggested that low-impact non-experiential feedback had minimal effect on teacher efficacy, and that the minimal effect was primarily due to changes in general teaching efficacy

Self-efficacy in Preservice Teachers: Testing the Limits of Non-experiential Feedback

The role and function of teachers have received much attention in the educational literature. Recently, considerable focus has been placed on some of the "human" variables in teaching, such as teacher motivation and self-efficacy beliefs (e.g., Chester & Beaudin, 1996; Gibson & Dembo, 1984; Ozcan, 1996; Soodak & Podell, 1996; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Self-efficacy, in particular, has surfaced as a seemingly important variable that serves to contribute to overall teacher motivation.

According to Bandura (1986, 1989), one's self-efficacy beliefs serve a mediating and predictive function for one's level of motivation when confronting a task. Drawing upon the work of Bandura (1977, 1986) and Gagne' (1985), Chester and Beaudin (1996) noted that "[t]he motivation to pursue a task or challenge (such as teaching in an urban school) arises from individuals' internalized goals, needs, and aspirations, which are dependent on the self-efficacy mechanism" (p. 235). As such, the step from self-efficacy beliefs to motivation seems to be a short one.

Bandura originally conceptualized self-efficacy as a two factor construct that includes both outcome expectations following from certain behaviors and personal beliefs concerning one's ability to perform those behaviors. Bandura proposed that the confidence (belief) that one has in a certain behavior to bring about a certain outcome interacts with the belief one has in his or her ability to actually carry out that behavior to result in actual behavior by the individual. Furthermore, Bandura (1997) suggested four areas that may serve as sources of efficacy: mastery experiences, vicarious learning, social/verbal persuasion, and emotional/physiological arousal. Each of these may contribute in varying degree to the development of efficacious beliefs about a given task.

Among the first to extend Bandura's model to teachers were Ashton and Webb (1982). They proposed that Bandura's first element of outcome expectations corresponded to a teacher's belief about whether or not teachers and/or teaching methods could impact a student's learning and motivation. This factor was called teaching efficacy, later to be called general teaching efficacy (GTE) in the literature (Tschannen-Moran et al., 1998). Ashton and Webb (1982) also proposed that Bandura's second element

corresponded to a teacher=s belief in his or her own ability to perform in such a way that would bring about increased learning and motivation in students, including those that may be difficult to reach. This factor was called personal efficacy, later to be called personal teaching efficacy (PTE).

Self-efficacy and Effective Teaching

In a climate of educational reform (Cuban, 1990), research in teaching effectiveness and motivation has burgeoned. The study of self-efficacy beliefs, in particular, has consistently shown teacher efficacy to be associated with a variety of effective teaching behaviors and attitudes (Tschannen-Moran et al., 1998). For example, teachers with high efficacy are less critical of student errors (Ashton & Webb, 1986), tend to persist longer with struggling students (Gibson & Dembo, 1984), exhibit greater enthusiasm for teaching (Allinder, 1994; Hall, Burley, Villeme, & Brockmeier, 1992), and have greater commitment to teaching (Coldarci, 1992; Evans & Tribble, 1986).

With a considerable number of studies supporting the close relationship between efficacy and effective teaching behaviors, some researchers have subsequently attempted to positively impact efficacious beliefs in teachers through

inservices or other professional development activities (Ohmart, 1992; Ross, 1994; Stein & Wang, 1988). Results from these studies suggest that self-efficacy in experienced teachers is a relatively stable construct over time and that gains in efficacy are often lost after cessation of the intervention.

Self-efficacy in Preservice Teachers

Studies attempting to impact efficacy in preservice teachers, however, have proven more fruitful. As noted by Tschannen-Moran et al. (1998), "[t]he development of teacher efficacy beliefs among prospective teachers has generated a great deal of research interest because once efficacy beliefs are established, they appear to be somewhat resistant to change" (p. 235). Presumably, this difference between preservice and practicing teachers is due to the formative nature of a preservice teacher's beliefs about his or her teaching. A teacher-in-training may be more receptive to instructional feedback. Additionally, teaching observations and/or experiences may be more salient for someone yet to foreclose on a career identity.

For example, Volkman, Scheffer, and Dana (1992) studied the positive effects of field-based reflective

practice on preservice teacher efficacy. Other studies focusing on preservice teachers have found that self-efficacy is often enhanced in the context of learning relationships in which preservice teachers are able to avail themselves of feedback from experiences, colleagues, supervisors, and/or the general social environment (Clifford & Green, 1996; Gorrell & Capron, 1989, 1990; Ramey-Gassert & Shroyer, 1992; Watters & Ginns, 1995; Wilson, 1994). The common element in these studies is some form of environmental feedback by which the preservice teachers can evaluate and compare their own perceived abilities with what would be considered effective teaching. One result of such feedback tends to be enhanced self-efficacy.

More specifically, experiential activities, such as teaching practica or other mastery experiences, seem to have greater impact on the PTE of preservice teachers (Housego, 1992; Hoy & Woolfolk, 1990; Sia, 1992). Such experiences allow for a direct evaluation of one's abilities as a teacher. GTE, however, may be fostered less by experiential activities and more by vicarious learning or verbal persuasion, such as that received in college

coursework (Tschannen-Moran et al., 1998; Watters & Ginns, 1995).

Research Questions

While a fairly clear link has been established between experiential feedback (in a variety of settings) and preservice teacher self-efficacy, it is less certain whether or not general feedback that occurs outside of purely experiential settings (e.g., comments from instructors, research findings, textbooks, etc.) has an impact on preservice teacher self-efficacy. The present study addressed two research questions related to this issue:

1. What is the effect of a simple paragraph concerning the positive abilities of preservice and newly graduated teachers on the PTE and GTE of preservice teachers? Such feedback may resemble that received by education students from college texts or verbally from instructors, thereby helping to assess the social/verbal persuasion source of efficacy postulated by Bandura (1997). Based on prior research, it was predicted that, if an effect was observed, GTE would increase more than PTE due to the nature of the feedback. The feedback was designed as a "weak treatment"

(simple paragraph reading) in order to test the limits of non-experiential feedback of this sort.

2. Does saliency of the feedback mediate its effect on PTE and GTE? It was predicted that larger effects would be observed from preservice teachers that held higher levels of agreement with the treatment paragraph.

Method

Subjects

Subjects consisted of 142 preservice teachers (90% female, 10% male) enrolled in an educational psychology course in a large state university in the southwest (1% sophomores, 28% juniors, 70% seniors, 1 graduate). Mean age was 21.74 (SD = 2.23). Subject ethnicity was as follows: Caucasian (89%), African American (1%), Hispanic (8%) and other (2%). Participation was voluntary and had no impact on the subjects' course grade.

Instruments

Teacher Efficacy Scale (TES). Several researchers have developed instruments to assess levels of efficacy in teachers (Gibson & Dembo, 1984; Soodak & Podell, 1996; Woolfolk & Hoy, 1990). Soodak and Podell (1996) and Tschannen-Moran et al. (1998) discuss the relative strengths and weaknesses of many of these attempts to

measure teacher efficacy, as well as providing their own formulations. Historically, however, Gibson and Dembo's (1984) Teacher Efficacy Scale has been the predominant instrument used in the measurement of teacher efficacy (Ross, 1994). It has also served as a point of origin in many later studies attempting to develop alternative instruments (Tschannen-Moran et al., 1998).

The 16-item self-report TES was used in the present study to assess teacher efficacy in the preservice teachers. Use of the TES with preservice teachers has yielded reliable and valid scores in previous studies (Correll & Hwang, 1995; Guyton, 1994; Pigge & Marso, 1993; Volkman et al., 1992; Woolfolk & Hoy, 1990). Subjects used a six point Likert scale anchored at "strongly disagree" and "strongly agree" to respond to items such as: "The amount that a student can learn is primarily related to family background" (GTE). Scores on items were averaged to yield total scores for the two sub-scales: PTE (9 items) and GTE (7 items). Six items on the GTE sub-scale were reverse scored so that high scores on both sub-scales would indicate high efficacy.

Stimulus paragraph. The treatment group read a fabricated paragraph designed to bolster beliefs of

efficacy (see Appendix). The paragraph format and content were selected to represent a low-impact treatment to test the limits of the effect of non-experiential feedback on self-efficacy. The control group read an unrelated paragraph about constructivism of similar length.

Saliency of paragraph. In order to assess saliency of the paragraph for the subject, each respondent rated his or her agreement-to-the-paragraph on a six-point Likert scale anchored at "strongly disagree" and "strongly agree". Treatment subjects were then asked to briefly write their opinion on why preservice teachers are considered effective as noted in the paragraph. Control subjects also wrote their opinion concerning the unrelated paragraph.

Teaching experience. Subjects self-reported the number of hours they have participated in teaching related activities. They reported hours per activity per day per month; these data were then aggregated to the highest level to yield a total number of teaching experience hours. Subjects were cued to report activities that related to teaching in schools, observations in schools, teaching or observations in non-school learning environments (e.g., day care, Sunday school, etc.), or other leaderships roles in educational settings.

Procedure

Subjects reported their teaching experience and were ranked according to number of hours of experience (M = 287.66, SD = 319.24). A matched pairs experimental design was used to place subjects into experimental (n = 75) and control (n = 67) groups based on instructional experience. Group sizes were unequal due to slight attrition and several incomplete protocols. Subjects of similar experience level were randomly assigned to one of the two groups. The matched pair assignment was used to explicitly control for the teaching experience variable which has been shown to impact beliefs of self-efficacy.

Approximately four weeks following the collection of teaching experience data, the research protocol was administered during the first part of the subjects' class. The treatment group read the stimulus paragraph, rated their agreement to it, briefly wrote their opinion about why preservice teachers are considered effective, and completed the TES. The control group followed the same protocol but read the unrelated paragraph. The procedure was completed in about 20 minutes.

Analysis

Descriptive discriminant analysis was conducted to examine differences in efficacy between treatment and control groups. A canonical correlation was conducted to evaluate the possible mediating effect of paragraph saliency on efficacy. Subjects' paragraph agreement rating was treated as the predictor variable with PTE and GTE as the criterion variable set.

Generally, of course, a canonical correlation analysis includes at least two variables in each variable set. However, only paragraph agreement was used in the present study's predictor set. Canonical correlation was selected over univariate regression analyses in order to allow for a possible multivariate interaction in the dependent variable (Fish, 1988). Since canonical correlation represents the most general form of the general linear model (excluding structural equation modeling), use of one predictor variable will not adversely impact results (Campbell & Taylor, 1996; Henson, 1999).

Results

PTE scores (M = 4.51, SD = .55) yielded a reliability of .81. The reliability of scores on the GTE scale (M = 3.69, SD = .68), while lower, was within acceptable limits

for analysis (alpha = .61). These coefficients mirror those reported in previous research (Gorrell & Hwang, 1995; Guyton, 1994; Pigge & Marso, 1993; Volkman et al., 1992; Woolfolk & Hoy, 1990).

No statistically significant differences between treatment and control groups were found from the discriminant analysis, $\chi^2(2, 139) = .532$, $p = .767$. The very low eigenvalue (.0038) and low canonical correlation (.0618) also highlight the lack of discrimination between groups on the dependent variables.

Table 1 reports the standardized discriminant function coefficients and structure coefficients for the discriminant function. GTE yielded the largest standardized and structure coefficients. The structure coefficient for GTE (.9882) revealed an almost perfect correlation between GTE and the discriminant function while PTE had only a moderate relationship with the latent variable (.4051). These results indicate that GTE possessed the primary variance used to yield the minimal effect obtained.

INSERT TABLE 1 ABOUT HERE

Table 2 displays results from the canonical correlation solution for the treatment group with paragraph agreement as the predictor and GTE and PTE as criterion variables. The obtained canonical correlation (R_c = .370) was statistically significant, $F(2, 72) = 5.712$, $p = .005$, and yielded a squared canonical correlation effect size of 13.7%. An examination of the standardized canonical function coefficients and the squared canonical structure coefficients reveal differing contributions of PTE and GTE to the criterion synthetic variable. Specifically, PTE was highly positively correlated with the criterion synthetic variable (r_s = .860) while GTE was only slightly correlated and in the negative direction (r_s = -.262). The canonical correlation (R_c = .370), then, is largely a result of PTE scores by persons for whom the stimulus paragraph was salient (as measured by self-reported scores of paragraph agreement) and much less so of GTE scores of persons for whom the paragraph was minimally salient.

INSERT TABLE 2 ABOUT HERE

Discussion

The data do not indicate that the stimulus paragraph made either a substantive or statistical difference between treatment and control groups. These results may be attributable to two possibilities. First, the "weak" treatment (i.e., stimulus paragraph) may simply not have been strong enough to affect preservice teacher efficacy. Second, as indicated in other research (Clifford & Green, 1996; Gorrell & Capron, 1989, 1990; Ramey-Gassert & Shroyer, 1992; Watters & Ginns, 1995; Wilson, 1994), self-efficacy may indeed be most readily affected by experiential feedback as opposed to the non-experiential feedback utilized in the current study.

It is interesting to note that GTE clearly made the most contribution to the discriminating function for the minimal effect that was observed. An examination of GTE's discriminant function and structure coefficients in Table 1 indicate this contribution as against that of PTE. These results suggest that GTE scores, as predicted, were most affected by the treatment, supporting prior research concerning non-experiential forms of feedback on self-efficacy in preservice teachers (Tschannen-Moran et al., 1998; Watters & Ginns, 1995). However, no definitive

conclusions in this regard can be based on the present data due to the low effect and possible impact of sampling error.

It is not unreasonable, though, to note that the feedback treatment used here was probably simply too weak to yield a more categorical outcome. The data do suggest that had a stronger treatment been used, then a larger effect may have been attributable to the GTE variable. Of course, future studies will need to verify this hypothesis in order to ultimately test the true limits of the effects of non-experiential feedback (e.g., via repeated contact, cumulative effects, etc.) on self-efficacy in preservice teachers.

Paragraph saliency was a meaningful predictor PTE scores with PTE making the most contribution to the synthetic criterion variable. Subjects that scored high in PTE tended to agree with the stimulus paragraph. Subjects' GTE scores made a much smaller, and inversely proportional, contribution to the criterion synthetic variable and subsequently to the canonical correlation.

It is not immediately intuitive to note that GTE scores can be most affected by the treatment paragraph (as against PTE scores) even though saliency of the paragraph

has a minimal affect on GTE scores. Put simply, it was not necessary for the preservice teachers to personally agree with the paragraph in order for their GTE scores to be affected by the treatment more than PTE scores. These data support the distinctiveness of the GTE and PTE constructs (Gibson & Dembo, 1984; Tschannen-Moran et al., 1998). Specifically, GTE refers to a teacher's belief in the efficacy of other teachers and the teaching profession in general while PTE describes a teacher's personal belief in their own ability to perform effectively. Given that GTE is "other-oriented", it is theoretically consistent that the preservice teachers' personal agreement with the paragraph did not impact the effect on their GTE scores, at least as relative to their PTE scores.

Our findings support the previously noted literature that suggests that self-efficacy is strongly experientially based. They are also suggestive that non-experiential forms of feedback may indeed serve as sources of efficacy in preservice teachers, for GTE in particular. However, future studies with stronger treatments must be conducted to empirically verify such a claim. Unexpectedly, the present study has also provided a unique perspective on the construct validity of the GTE and PTE constructs.

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Table 1

Discriminant Analysis Coefficients (n = 142)

Dep. Var.	Stand. Function Coefficients	Structure Coefficients
GTE	.94699	.98824
PTE	.15835	.40507

TABLE 2

Canonical Solution for Paragraph Agreement by GTE and PTE

Variable/ Coef.	Func.	r_s	r_c^2
Par. Agree.	1.000	1.000	100.0
Adequacy			100.0
Rd			13.7
Rc^2			13.7
Rd			5.5
Adequacy			40.5
PTE	1.001	.860	74.0
GTE	-.530	-.262	6.9

Appendix

According to current research, teacher education programs in colleges and universities do an excellent job of preparing their preservice teachers to perform well in real-world settings. Teachers coming out of these programs routinely maintain that they have the abilities and decision-making skills required of effective teachers, even without years of experience. Their feelings of effectiveness as teachers has been shown to increase during their educational program and carry into the time when they take their first position. Preservice and first-year teachers often report that they are very confident in their skills and abilities to teach well. Specifically, preservice teachers that participate in observational and reflective activities feel more certain about their ability to effectively teach even if they originally were uncertain about their abilities. In general, then, it seem clear that preservice teachers have the skills and abilities to be effective facilitators of student learning.